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J. FRANKLIN CROWELL,
Secretary.

SCIENTIFIC BOOKS.

The Vegetation of the Lamao Forest Reserve.

By H. N. WHITFORD. *The Philippine Journal of Science*, Vol. I., No. 4, pp. 373-432, pls. 1-27, with map; May, 1906; and Vol. I., No. 6, pp. 637-682, pls. 28-45; July, 1906.

This paper embodies a careful descriptive account of a large body of virgin forest near Manila, in the study of which the author has carried into the tropics the precise methods of temperate forestry and the viewpoint of physiographic ecology as developed by Cowles. The Lamao Reserve occupies an area of 4,426 hectares on the eastern slopes of Mount Mariveles, which is located in the center of the peninsula which forms the northern mouth of Manila Bay. The reserve runs from sea-level up to 1,406 meters altitude and presents throughout an erosion topography. The climate of the region is shown to possess a marked dry season from December to April, with copious rains in the remaining months; the annual curve of humidity follows that of rainfall and the temperature is rather constant with an annual mean of 36° C. and an annual mean range of 3.4° C.

The forest is midway in character between the evergreen hygrophilous forest and the monsoon forest, differing from each in having an intermingling of evergreen and deciduous trees. The author distinguishes six types of forest formation in his area with distinctions due to differences of altitude and the attendant change in climatic conditions: (1) The Strand, which is found to agree closely with that described by Schimper for the Indo-Malay Peninsula. (2) The Bambusa-Parkia formation, characterized by an open stand of trees many of which are leafless throughout the dry season, and by pure and mixed growths of several species of bamboo, which are in effect partly deciduous. (3) The Anisoptera-Strombosia formation inclines less to the

monsoon type, as it contains no trees which are leafless throughout the dry season; bamboos are here replaced by small dicotyledonous trees; the specific make-up of the forest is very complex. (4) The Dipterocarpus-Shorea formation exhibits an almost complete absence of deciduous trees and a simpler floristic make-up than the formations at lower altitude. Here the variations due to differing physiographic situation begin to be manifest. (5) The Shorea-Plectonia formation lies between 400 and 900 meters altitude and has a more hygrophilous climate than the last formation with a more abundant representation of pteridophytes and bryophytes. The instability of the substratum in this formation and the next prevents as rich a development of the forest as the climate would lead one to expect. (6) The Eugenia-Vaccinium formation lies above 900 meters altitude and is characterized by a very humid and cloudy climate together with high winds. The forest is here xerophilous and stunted on the ridges, although more hygrophilous in the ravines and depressions. Epiphytic vegetation abounds and liverworts and filmy ferns are common. Many genera are represented in this formation which are common to tropical mountains throughout the world or even to the temperate regions.

In the Bambusia-Parkia formation a study has been made of the clearings, known as 'parangs,' and the return of these areas to the climax forest. Some six types of parangs are characterized, in each of which the flora is poorer than in the original forest, and may consist largely of comparatively pure stands of certain small trees or may be occupied by the climbing bamboo *Dinnochloa*. In each of the formations a detailed enumeration of the forest trees has been made in several plots on different soils or in different physiographic situations. The summation of results for six plots in the Anisoptera-Strombosia formation, aggregating 5,850 square meters in area, shows a total flora of 99 species. Of these the five most abundant form but 35 per cent. of the total and 64 are represented by three individuals or less. In another series of seven

plots in the same formation 120 species were found of which the five commonest form 30 per cent., and 91 form each less than 1 per cent. Quite as striking as the wealth in species and the poverty in individuals is the variation between the different plots in the same formation.

Note has been taken of the lianes, epiphytes and herbaceous vegetation, and many valuable observations made on the foliage, bark, latex, buttresses and cauliflory of the trees. It is unfortunate that more attention could not have been given to the herbaceous vegetation.

The paper as a whole, with its abundant illustrations, gives a vivid picture of the vegetation of a region not before well known to us. Manifest importance attaches to the carrying into the tropics of the detailed and comprehensive methods of studying vegetation which have been in use in the temperate regions. The fact that our methods and our points of view are both the products of the study of temperate vegetation must compel care in the application of these in the tropics. While the method of the study of plots gives interesting results as to the wealth and composition of a tropical forest when first applied in a particular region, yet it does not give facts of the same order as those ascertained by the study of plots in the temperate zone, as may be seen by a comparison of the lists for plots in the same formations in the Lamao reserve. The reviewer doubts if the term 'climax forest' is one that would have come into existence if the first students of physiological plant-geography had resided and worked in the tropics. The term is certainly an extremely elastic one as used by Dr. Whitford.

It is greatly to be hoped that we may have in the near future further papers of this nature from members of the botanical and forestry staffs of the Philippines.

FORREST SHREVE.

THE WOMAN'S COLLEGE, BALTIMORE.

SCIENTIFIC JOURNALS AND ARTICLES.

Bird-Lore for September-October contains a well-illustrated article on 'The Home Life of the Red-tailed Hawk,' by Robert W. Heg-

ner; an account of 'The Nesting of the Arctic Three-toed Woodpecker in the Adirondacks,' by Lawrence Achilles; an article on 'The Rose-breasted Grosbeak,' by Frederick L. Holtz, and one on 'The Habits of the Black Vulture,' by A. A. Saunders. W. W. Cooke contributes the eighteenth paper on 'The Migration of Warblers.' In notes and news are the records of two plume sales in London, footing up over 35,000 birds, including 19,000 birds-of-paradise. The Audubon leaflet is devoted to the blue jay.

The Zoological Society Bulletin for October has an article, with a good illustration, on the African pygmy Ota Benga, and there are good papers on 'The Collection of Reptiles,' 'How Seals are Trained,' 'The White Peacock' and 'How Birds get Their Food.' The capture of two tarpon in New York Bay is recorded and there is a description of a new sea-horse from Bermuda to which the name *Hippocampus kincaidi* is given. Judging from the figure, it should belong in another genus. There is probably a slip of the pen in the statement under the cut of 'One of the Largest of Our Tortoises' that 'The growth of this specimen has been so great as to oppose the theory of the great age which these reptiles are supposed to attain.' What is doubtless meant is that great size does not necessarily mean great age, for these tortoises have been known to live over one hundred years.

The Museum News of the Brooklyn Institute Museums for October begins its second volume with a brief summary of the summer's work. In the section devoted to the Children's Museum is a good account of Tadourac and the Saguenay River, in which the occurrence of the killer, *Orca*, is noted. The museum has a living specimen of *Hyla andersoni*.

SOCIETIES AND ACADEMIES.

THE ST. LOUIS CHEMICAL SOCIETY.

THE first meeting after the summer recess of the St. Louis Chemical Society, was held on Monday, October 8. A report 'On the National Pure Food and Drug Law, and On the Recent Hearing by the Official Commis-